

EXHIBIT A

**SECTION 02713
CURED-IN-PLACE PIPE LINING**

PART 1 - GENERAL

1.01 SUMMARY:

A. Section Includes:

1. Furnish all labor, materials, transportation, and equipment necessary to rehabilitate existing East Boston Branch Sewer combined sewer, by means of the installation of a cured-in-place pipe (CIPP) lining.
2. Design, Manufacture and Delivery of CIPP Lining Material.
3. Install CIPP Lining into Host Conduit.
4. Reinstate connections as indicated on the Contract Drawings from within the CIPP.

B. Related Sections:

1. Section 01025 - Measurement and Payment
2. Section 01300 - Submittals
3. Section 01015 - Sequence of Work and Schedules
4. Section 01400 - Quality Control
5. Section 01200 - Maintenance of Traffic
6. Section 02603 - Bypass Pumping and Diversion of Wastewater Flows
7. Section 02510 - Conduit Cleaning
8. Section 02520 - Inspection of Conduits and Manholes

1.02 REFERENCES:

- A. ASTM F1216 - Rehabilitation of Existing Pipelines and Conduits by Inversion and Curing of a Resin Impregnated Tube.
- B. ASTM D570 - Standard Test Method for Water Assorption of Plastics.
- C. ASTM D638 - Test for Tensile Properties of Plastic.

EBBS REHABILITATION

02713-1

OCTOBER 2002

- D. ASTM D648 – Standard Test Method for Deflection Temperature of Plastics Under Flexural Loading in the Edgewise Position.
- E. ASTM D790 - Test for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Material.
- F. ASTM D2990 - Test Method for Tensile, Compressive and Flexural Creep and Creep Rupture of Plastics.
- G. ASTM D1598 - Test Method for Time to Failure of Plastic under Constant Internal Pressure.
- H. ASTM D2837 - Obtaining Hydrostatic or Pressure Design Basis for Thermoplastic Pipe Materials.
- I. ASTM D2412 - Stiffeners Test.

1.03 DEFINITIONS:

- A. Cured-in-Place Pipe Liner (CIPP) is defined as a woven or non-woven or combination of woven and non-woven material surrounded or impregnated with thermal setting resin that when installed and processed, forms to the shape and size of the interior wall of the host conduit as defined in ASTM Standard F1216, Subsection 3.2.1.
- B. Host Conduit is defined as the existing East Boston Branch Sewer to be rehabilitated by CIPP Lining. The host conduit for this project varies in size as indicated on the Contract Drawings.

1.04 SYSTEM DESCRIPTION:

A. Design Requirements:

- 1. (The existing conduit shall be considered to be partially deteriorated and therefore designed in accordance with ASTM F1216. Design the CIPP lining to be capable of withstanding maximum hydrostatic loads. The fully cured-in-place pipe shall conform to the following minimum structural properties and current ASTM testing standards:

- a. Tensile Strength at Yield ASTM D 638: 3,000 psi minimum.
- b. Flexural Strength Modified ASTM D 790: 4,500 psi minimum.
- c. Modulus of Elasticity Modified ASTM D 790: 250,000 psi minimum to 300,000 psi maximum.

528
ADDENDUM
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- d. ~~Modulus of Elasticity Long-Term 50% of manufacturer's recommended flexural modulus, 125,000 psi minimum to 150,000 psi maximum.~~
 - e. Factor of Safety: 2 38.75
 - f. Percentage Ovality (36-1/2" X 41" pipe segment): 6% minimum 5.8%
 - g. Design Groundwater shall be five (5) feet below the ground surface elevation for the entire length of the cured-in-place rehabilitation.
 - k. Design Life: 50 years.
2. Pre and Post Installation Television Inspections shall be performed by the Contractor in accordance with Section 02520.
 3. The Contractor shall conduct a thorough review of the Pre-Installation Television Inspection videos to determine the ovality and other conditions that may affect the design or installation of the liner into the host conduit. These factors should be given appropriate consideration in the Design.

1.05 SUBMITTALS:

- A. ⁽¹⁾ Product Data: The Contractor shall submit product data to the Authority for review in accordance with Section 01300.
- B. Quality Control Submittals: 2. Installation
 1. Design Data:
 - a. The Contractor shall submit written descriptions of the construction methods and equipment to be used for storage, handling, installation, curing, control, cool-down, curing schedule for resins used, finish of the CIPP liner and equipment layout. Suggested access locations are indicated on the Drawings and have been coordinated with the Authority and the Boston Transportation Department. Any revisions or alterations shall be resubmitted by the Contractor to the Boston Transportation Department and the Authority for review and approval.
 - b. The Contractor shall submit written descriptions of the methods and equipment proposed to be used for repairs to the host conduit based on the Pre-Construction video tapes. Such repairs shall be in accordance with the CIPP liner manufacturer's recommended written procedures and techniques.

c. *Defects*
The Contractor shall submit written descriptions of the methods and equipment for the repair of defects in CIPP liner observed during post-installation inspection.

See Appendix #4
d. The Contractor shall submit a Certificate of Design to be signed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts for the design calculations for each section of conduit to be rehabilitated by CIPP lining as indicated in the Contract Documents. The Contractor shall include the calculations with the Certificate of Design for the Authority's records only and not for the Authority's review and approval. A sample Certificate of Design is appended to the end of this Section.

(a)
e. *(b)* The Contractor shall submit a Certificate of Design to be signed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts for the calculations showing peak flow capacities using the expected Mannings "n" roughness coefficient.

(4) Size/Design/Chart
The Contractor shall verify prior to fabricating the liner tube the existing internal dimensions of each of the host conduits to be rehabilitated by CIPP lining, and submit sizes to the Authority for review.

g. The Contractor shall submit a progress schedule prepared in accordance with Section 01015 that ensures that excessive surcharging will not occur in any pipeline section due to the sequence of the work.

(2) Resin h. The Contractor shall submit a written description of the exact makeup of the resin including chemical resistance information, cure logs and temperatures, and the exact mixture ratio of resin and catalyst.

i. The Contractor shall submit copies of the shipment documents from the resin manufacturer showing dates of shipment, the originating location and receiving location.

2. Test Reports:

a. The Contractor shall submit independent third-party test results with respect to the physical properties of the CIPP liner material from a certified testing company. These tests shall be performed in accordance with ASTM F1216 and shall include the following:

1. Long-Term Reduction in Physical Properties -- Long-Term creep data based on a hydrostatic loading shall be submitted by the manufacturers of the CIPP material products. Duration of creep testing shall be a minimum of 10,000 hours.

(2)

2. CIPP Field Samples -- To verify past performance, the manufacturer shall submit a minimum of 15 test results from at least five (5) previous field installations of the same resin system and tube materials as proposed for this Project.

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3. Material Test Data -- The Contractor shall submit test data to the Authority for review. The test data is to prove that the CIPP material is chemically resistant to chemicals normally encountered in a wastewater collection system as listed in ASTM F1216, as well as the constituents seen in the EBBS sediment samples as provided the document Sedimentation Sampling and Analysis Report, East Boston Branch Sewer Relief Project, Contract No. 6256, JE Sverdrup, October 30, 2000 referenced in Section 01010 1.06. The CIPP material shall also be shown to be chemically resistant to soils and groundwater surrounding the host conduit as reported in the hazardous waste geotechnical reports referenced in Section 01010 1.06.

(9)

4. Submit test data on resins to be used on project showing chemical makeup of resin and proof that resin does not emulsify when mixed with water or is detrimentally harmed by hydrocarbon (fuel oil) based products.

3. Certificates:

a.
Design
(c)

Prior to the fabrication of CIPP liner, the Contractor shall submit a Certificate of Design for the CIPP liner proposed. The Certificate of Design shall be signed by a Licensed Professional Engineer for the preparation of the design calculations, and the Licensed Professional Engineer shall be registered to practice in the Commonwealth of Massachusetts.

b.
Resin
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(10)

Prior to manufacture of the CIPP liner, the Contractor shall submit a Certificate of Authenticity from the resin manufacturer for each resin shipment including the date of manufacture and the heat distortion temperature.

4. Manufacturer's Instructions:

a.
b.
(11)

Resin manufacturer's requirements for handling and storage of the resin.

Selected temperature, temperature monitor procedures, and expected duration of curing time required to ensure proper curing.

5. Manufacturer's Field Reports

- a. Field reports generated by manufacturer's qualified personnel to monitor the entire lining manufacturing and installation processes.
- b. Field reports generated by manufacturer's qualified personnel to monitor resin impregnation process both at the CIPP tube manufacturer's wet out and on-site wet out.

1.06 QUALITY ASSURANCE:

A. Qualifications:

1. The Contractor's CIPP liner supervisor shall have, at a minimum, five (5) years experience supervising CIPP installations with two (2) completed within the last five years, similar in size and shape to be rehabilitated under the project (30-inch to 48-inch diameter and egg-shaped sewers) and length comparable to that required for this project.
 - a. The qualifications of all supervisor shall be submitted within 14 calendar days of the Notice to Proceed. These qualifications shall include the following:
 1. Names of all supervisors with references to be directly involved with CIPP lining for the Work.
 - b. The Contractor shall sign and date the information provided and certify that to the extent of its knowledge, the information is true and accurate, and that the supervisory personnel for the CIPP pipe rehabilitation method will be directly involved with and used on this project. Substitutions of personnel and/or methods will not be allowed without the written authorization of the Authority.
2. The firm installing the cured-in-place liner shall also have successfully completed at least two (2) sewer rehabilitation project contracts in the United States of America, during the last five (5) years, involving, the cured-in-place pipelining methods; and shall have included within its scope of work the following provisions: cured-in-place rehabilitation with installation lengths of at least 1,000 continuous linear feet of 30 to 48 inch diameter and egg shaped sewers or larger diameter sewer pipe, on-site wet-out or resin impregnation of the pipeliner tube, and installation of temporary sewage flow bypass systems to divert all main and local connection sewage flows around the work area.
3. The firm installing the cured-in-place liner shall be fully licensed by the cured-in-place lining manufacturer.

4. The manufacturer shall have designed and manufactured at least two (2) cured-in-place pipelining systems in the United States of America, during the last five (5) years, for rehabilitation of 30 to 48 inch diameter and egg shaped sewers or larger diameter sewer pipe on a project that required installation lengths of at least 1,000 continuous linear feet, and on-site wet-out or resin impregnation of the pipeliner tube.

1.07 DELIVERY, STORAGE AND HANDLING:

A. Handling and Shipping:

1. The Contractor shall exercise extreme care during transportation, handling, storing, and installation of the CIPP lining to ensure that the material is not torn, cut, or otherwise damaged.

B. Acceptance at the Site:

1. If any part or parts of the CIPP liner material becomes torn, cut, or otherwise damaged before or during installation, it shall be repaired or replaced before proceeding with further installation at no additional cost to the Authority.

C. Storage and Protection

1. The Contractor shall handle and store the CIPP liner as recommended by the manufacturer to ensure installation in a sound, undamaged condition.
2. The Contractor shall follow the resin manufacturer's requirements for handling and storage of the resin prior to, during, and following impregnation of the tube.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Cured-in-Place Pipe Lining

1. The CIPP liner shall consist of a fabricated polyester felt tubing finished on the inside with a polyurethane, polyvinyl chloride or polyethylene layer. The felt tubing shall be completely saturated with a liquid thermosetting resin.
2. Seams of CIPP linear shall not be stitched together. Electronic bonding of seams shall be used.
3. The CIPP, when cured, shall be chemically resistant to withstand internal exposure to sewage gases, such as hydrogen sulfide, carbon monoxide, carbon

dioxide, methane; traces of mercaptans, kerosene, naphthalene, methylene chloride, trichloroethylene; saturation with moisture, dilute sulfuric acid; external exposure to soil bacteria and any chemical attack from petroleum based chemicals in the soil and groundwater which may be due to materials in the surrounding ground.

4. The liner content volume prior to impregnation with resin shall be determined by the Contractor, but shall not exceed 25 % of the total impregnated liner volume.
5. The liner shall be fabricated to a size that, when installed, will neatly fit into the internal shape of the host conduit without wrinkles. Allowance shall be made for longitudinal and circumferential stretching during insertion. All dimensions shall be verified by the Contractor prior to construction.
6. The length of the liner shall be sufficient to effectively carry out the installation and seal the liner at the inlet and outlet manholes unless otherwise specified. The Contractor shall field-verify all lengths prior to installation.
7. The wall thickness of the CIPP shall be as determined by the Contractor and approved by the Authority. The cured liner wall thickness shall be + 10 % to - 5 % of the approved design thickness.
8. The CIPP shall be a full reinforced pipe. Fiberglass or similar reinforced product will not be allowed.

B. Resins:

1. The resin shall be **PREMIUM, NON-RECYCLED** corrosion resistant thermosetting type polyester or vinyl ester resin only. Resins, containing fillers, additives or enhancement agents shall not be used. The resin manufacturer shall not include any old resin or rework in the product shipped to the wet-out facility. The resin shall be manufactured under ISO 9002 certified procedures.
2. Polyester resins shall have a minimum Heat Distortion Temperature of 212 degrees Fahrenheit per ASTM D648. Vinyl ester resins shall have a minimum Heat Distortion Temperature of 220 degrees Fahrenheit per ASTM D648.
3. No additives or fillers shall be added to the approved resins to reduce the calculated volume of resins required.
4. The resin shall be shipped directly from the resin manufacturer's facility to the CIPP wet-out facility. The resin shall not be sent to any intermediate mixing facility.

5. The resin shall have an initial viscosity of 7,000-10,000 centipoise for CIPP installation and increase in viscosity to a minimum of 1.5 million centipoise within 24 hours for curing.
6. The resin shall limit water absorption to less than 0.15% weight gain after 24 hours at 73 degrees Fahrenheit when tested in accordance with ASTM D570.
7. Resins shall be designed so that the structural capacity of the cured resin does not become affected when in contact with hydrocarbon based products (fuel oil) while resin is in liquid state.

C. General:

1. The reinforcing material of the liner bag to be needle interlocked or welded polyester fiber felt formed into sheets of required thickness. Bags may be made of single or multiple layer construction, as accepted by the Authority. Mechanical strengthener membrane or strips may be sandwiched in between layers where required to control longitudinal stretching.
2. The Contractor shall furnish, prior to installation of the lining materials, a written guarantee stating that the materials and techniques to be used comply with the CIPP liner and resin manufacturers' standards.
3. The finished CIPP shall be continuous over the entire length of an insertion run between manholes and be free from visual defects such as foreign inclusions, dry spots, pinholes, and delamination. The CIPP installation shall be impervious and watertight.
4. The inner surface of the CIPP shall be free of cracks and crazing with smooth finish and with an average of not over two pits per square foot. All pits are to be covered with resin to completely cover the inner fabric.
5. Any defects which will affect the integrity or strength of the CIPP, shall be repaired or the CIPP replaced to the acceptance of and at no additional cost to the Authority prior to the reinstatement of flows into the pipe.


PART 3 - EXECUTION

3.01 EXAMINATION:

A. Verification of Conditions:

1. Cleaning of Host Conduit
 - a. The conduit to be rehabilitated by CIPP lining shall be cleaned in accordance with Section 02510.

2. Preinstallation Inspection

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- a. The conduit shall be inspected immediately before installation of the CIPP to verify that conditions are acceptable for the CIPP installation to proceed.
 - b. Television inspection of conduits shall be performed in accordance with Section 02520.

3. Materials and Equipment Availability

- a. The Contractor shall certify in writing to the Authority that the materials and equipment required to complete each liner inversion and curing are on-site prior to the start of the inversion process.

3.02 INSTALLATION:

A. Flow Diversion/Bypass Pumping

- 1. The Contractor shall provide for the diversion of flows in accordance with Section 02603.

B. Wet Out

- 1. The application of the resin to the felt tubing (Wet Out) shall be conducted by fully protecting the materials against UV light, excessive heat and contamination at all times.
- 2. The Contractor shall identify the wet out facility location where all CIPP liner under this Contract will be manufactured. All CIPP liner shall be manufactured from this designated wet out facility except for those short segments that require on-site wet out for seaming adjacent liners.

C. CIPP Lining

- 1. The Contractor shall provide venting and/or exhausting of all fumes or odors generated during, and remaining after, the curing process is completed. This process will remain in place on all manholes and laterals until all odors have been dissipated to a level where there is no air pollution or potential health hazard left to the general public in accordance with the resin manufacturer's Material Safety Data sheets.
- 2. ~~The liner shall be installed through existing manholes at the suggested locations indicated on the Drawings or through alternate existing manholes proposed by the Contractor and approved by the Authority. The Contractor may remove the top of the manholes down to the bottom of the taper section of the full diameter of the manhole riser to accommodate the installation of~~

the CIPP. The Contractor shall modify or repair manholes in accordance with Section 02601 and 02602, respectively. The Contractor shall employ appropriate earth support systems in accordance with the requirements of Section 02161 where insertion manholes require partial removal for liner installation.

3. A resin impregnated liner shall be inserted through a manhole by means of an inversion process. The inversion head shall be sufficient to hold the impregnated liner tight to the host conduit wall, producing dimples at the connections and flared ends at the termination point.
4. After installation of the CIPP liner into the host conduit, the Contractor shall perform all required curing in strict accordance with the manufacturer's written recommendations. The Contractor shall ensure that temperature of the liner is increased at a uniform rate to the temperature recommended by the manufacturer to effect a cure of the resin. This temperature and the period of time which the temperature must be maintained must be determined by the resin/catalyst system employed and as recommended by the manufacturer.
5. The heat source shall be fitted with monitors to accurately gauge the temperatures of the incoming and outgoing heat source. Another such gauge shall be placed between the CIPP liner and the host conduit invert at the removal end to determine the temperature during the curing process. The temperature in the CIPP lined host conduit during the curing process shall be that which is recommended by the resin manufacturer. The length of time for allowing the curing process to be completed shall be of the duration recommended by the resin manufacturer, during which time the Contractor will maintain the required temperature throughout the CIPP lined host conduit. Prior to curing, the Contractor shall notify the Authority of the selected temperature and expected duration of curing time required to ensure proper curing and will submit written concurrence from the CIPP liner and resin manufacturers of the curing temperature, temperature monitor procedures, and duration of curing time. The Contractor shall provide temperature strip chart data to the Authority for review to ensure curing temperatures for the resin meet the manufacturer's recommendations.
6. Curing of the CIPP must take into account the existing host conduit material, the resin system, ambient air temperature, and ground conditions (temperature, moisture level, and thermal conductivity of the soil and groundwater).
7. Cool-Down: The Contractor shall cool the hardened pipe to a temperature below 100 degrees Fahrenheit before performing exfiltration testing, and relieving the static head in the standpipe. If allowed by the resin manufacturer, cool-down may be accomplished by the introduction of cool water into the standpipe to replace water being pumped from the liner system. Care should be taken in the release of the static head so that a vacuum will not be developed that could damage the newly installed liner.

8. The flared ends at the entrance and exit manholes shall be sealed tight to the pipe and manhole wall. The seal shall be made with a resin mixture compatible with the liner.
9. Where the CIPP liner has been run continuously through a manhole, the top of the hardened liner shall be saw cut through the width of the manhole base to allow for maintenance access. Any void between the manhole apron and the CIPP liner shall be cleaned and filled with hydraulic grout to prevent accumulation of deposits.
10. The CIPP shall be cut 1-inch from the manhole walls after installation to facilitate the application of the cementitious epoxy coating as specified in Section 02602. The CIPP liner shall be sealed at the manholes to provide a watertight connection between the liner and the manholes.

D. Connections

1. After the new CIPP liner has been completely installed, all existing active public and service connections shall be reconnected. Existing active services shall not be reconnected by excavation. For non-person entry conduit, the reconnection shall be done from the interior of the rehabilitated host conduit by means of a television camera and a cutting device that reestablishes the service connection to not less than 95 % of the original diameter. For person entry conduit, the reconnection may be done from the interior of the rehabilitated host conduit by means of a remote control device as described above or a person-operated cutting device that reestablishes the service connection to not less than 95 % of its original diameter.

3.03 FIELD QUALITY CONTROL:

A. Tests:

1. The Contractor shall perform tests and certify that results are within specified limits in accordance with ASTM F1216. Test results shall be provided to the Authority. If any of the initial tests of the CIPP materials fail to meet the specified limits in accordance with ASTM F1216, the Contractor correct the deficiencies and perform additional material tests at no additional cost to the Authority.
2. The Contractor shall test samples of resins being used in CIPP tubing in presence of Authority for miscibility. On-site testing of resins shall be conducted for each batch of resin shipped to the wet out facility by mixing sample of resin being used in CIPP tubing with water in a glass jar. The mixture shall be shaken and observed to determine if resin emulsifies when mixed with water.

a. Resin Miscibility Test Procedure:

Mix a 50/50, by volume, mixture of resin and thickener in a glass-jar. Allow minimum of 15 minutes and maximum of 30 minutes for mixture to thicken. Once thickening is complete invert test jar, fill container full with water, replace lid/seal top and mix by shaking.

B. Inspection:

1. The Contractor shall perform post-installation television inspection of the installed liner in accordance with Section 02520.

C. Manufacturer's Field Service

1. The Contractor shall provide CIPP tube and resin manufacturer's qualified personnel to monitor the entire lining manufacturing and installation processes.

D. Material

1. For each length of CIPP liner installed, the preparation of two CIPP field liner samples is required:
 - a. The samples shall be fabricated from the material taken from the CIPP tube and the resin catalyst system used and cured in a clamped mold placed in the inversion standpipe.
 - b. The CIPP samples shall be large enough to provide five specimens for flexural testing and five specimens for tensile testing. The following test procedures shall be followed after the CIPP sample is cured and specimens removed:
 1. The initial tangent flexural modules of elasticity and flexural strength shall be measured in accordance with Test Method ASTM D790 and shall meet the requirements of these Specifications.
 2. The tensile strength shall be measured in accordance with Test Method ASTM D638 and shall meet the requirements of these Specifications.
 3. Tests shall be conducted by an independent laboratory and reports issued directly to the Authority.

PART 4 – APPENDICES

4.01 ATTACHMENT

- A. Appendix A - Table 02713 - 1 "CIPP Liner Insertion Locations"
- B. Appendix B – Certificate of Design

APPENDIX A

TABLE 02713 - 1
EAST BOSTON BRANCH SEWER REHABILITATION - CONTRACT 6840
CIPP LINER INSERTION LOCATIONS

INSERTION NO.	DRAWING NO.	FROM MANHOLE AT STATION	TO MANHOLE AT STATION	LENGTH OF INVERSION	PREMIUM RESIN REQ'D.	MANHOLES TO BE REHABILITATED OR MODIFIED	SUGGESTED BYPASS SET-UPS	DIVERSION SET-UPS	
								FROM	THROUGH
1	C-1, C-2	STA 3+80.26 In Section 38	STA 10+23.21 In Section 38	643 ft	Yes	STA 10+23.21; STA 7+00.06; STA 3+80.26 In Section 38	1		
2	C-2	STA 3+80.26 In Section 38	STA 34+20.07 In Section 37	1842 ft	Yes	STA 3+80.26; STA 0+59.08 In Section 38; STA 46+52.58; STA 43+31.35; STA 40+26.50; STA 37+19.74; STA 34+20.07 In Section 37	1 & 2		
3	C-2, C-3, C-4	STA 15+01.32 In Section 37	STA 34+20.07 In Section 37	1919 ft	Yes	STA 34.20.07; STA 30+34.27; STA 27+17.96; STA 24+11.82; STA 20+93.83; STA 18+48.50; STA 15+01.32 In Section 37	1, 2 & 3	Plug at Regulator RE-014-2; Plug at Regulator RE-014-6	BWSC Combined Sewer
4	C-4	STA 15+01.32 In Section 37	STA 4+75.08 In Section 37	1027 ft	Yes	STA 15+01.32; STA 12+00.70; STA 8+98.80 In Section 37	1, 2 & 3	Plug at Regulator RE-014-2; Plug at Regulator RE-014-6; Flow thru Plug, Plug on 12" Sewer on Curtis Street	BWSC Combined Sewer

EBBS REHABILITATION

02713-15

OCTOBER 2002

APPENDIX B

CERTIFICATE OF DESIGN

The undersigned hereby certifies that he/she is a Professional Engineer registered in the Commonwealth of Massachusetts and that he/she has been employed by (Name of Contractor) _____ to design _____ in

accordance with Specifications Section _____ for the East Boston Branch Sewer Rehabilitation Project (MWRA Construction Contract 6840). The undersigned further certifies that he/she has performed similar designs previously and has performed the design of the _____; that said design is in conformance with all applicable local, state, and federal codes, rules, and regulations and professional practice standards; that his /her signature and Professional Engineer (P.E.) Stamp have been affixed to all calculations and drawings used in, and resulting from, the design; and that the use of that stamp signifies the responsibility of the undersigned for that design. The undersigned hereby certifies that he/she has Professional Liability Insurance with limits of \$1,000,000 and a Certificate of Insurance is attached.

The undersigned hereby agrees to provide five (5) copies of the Design Drawings and Calculations to the Authority prior to ordering any materials and/or performing any work covered by this Certificate of Design.

P.E. Name

Contractor's Name

Signature

Signature

Title

Title

Address

Address

P.E. License No.

END OF SECTION